THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1 A method for forming fine particles of a substance, the method including contacting a non-gaseous fluid containing the substance with a dense gas to expand the fluid, the dense gas including (a) an anti-solvent and (b) a modifying agent which modifies the polarity of the anti-solvent.

2 A method according to claim 1 wherein the anti-solvent does not significantly alter the pH of the non-gaseous fluid.

3 A method according to claim 2 in which the substance is pH-sensitive.

4 A method according to claim 2 in which the substance is biologically active.

5 A method according to claim 4 in which the modifying agent both modifies the polarity of the anti-solvent and acts as an extractant for the non-gaseous fluid.

6 A method according to claim 2 in which the anti-solvent is selected from the group consisting of a C_{1-4} alkane gas, a C_{2-4} alkene gas, a C_{2-4} alkyne gas, refrigerant RF134a, or two or more thereof.

7 A method according to claim 6 in which the anti-solvent is ethane.

8 A method according to claim 6 in which the modifying agent is selected from the group consisting of C_{1-6} alkanols, C_{1-6} thiols and C_{1-6} amines.

9 A method according to claim 8 in which the modifying agent is ethanol.

10 A method according to claim 9 in which the non-gaseous fluid is an aqueous solution and sufficient modifying agent is used to extract substantially all of the non-gaseous fluid to facilitate precipitation of the substance.

11 A method according to claim 1 in which the anti-solvent and modifying agent are maintained as a single phase.

12 A method according to claim 11 in which the non-gaseous fluid containing the substance and the dense gas are maintained as a single phase.

13 A method according to claim 11 in which the single phase Is maintained by either or both by adjustment of the temperature and pressure of the dense gas and by controlling the relative flow rates of each prior to expansion of the fluid.

14 A method according to claim 1 in which the dense gas is between 5°C and 40°C and at a pressure of between 5 to 150 bar.

15 A method according to claim 1 in which the substance is selected from the group of proteins, nucleic acids, liposomes, lipids (including phospholipids), water soluble polymers, controlled-delivery coatings, surfactants and phytosterols, whether natural or synthetic.

16 A method according to claim 1 in which about 50% of the particles formed are between 625 and 10,000 nanometres across.

17 A method according to claim 1 in which over 50% of the particles formed are less than 10,000 nanometres across.

18 A method according to claim 1 in which over 50% of the particles formed are smaller than 6,500 nanometres.

19 A method according to claim 1 in which the anti-solvent and modifying agent are combined before being contacted with the non-gaseous fluid.

20 A method according to claim 12 in which the concentration of the substance in the non-gaseous fluid is adjusted to maintain a single phase between the non-gaseous fluid/substance and the anti-solvent/modifying agent.

21 Fine particles of a substance formed by a method according to claim 1.

22 Fine particles according to claim 21 in which the particles comprise primarily biologically active insulin.

23 Fine particles according to claim 22 in which at least 50% of the particles are less than 10,000 nanometres across.

24 A pH-sensitive, biologically active substance in the form of fine particles produced by a method according to claim 1.

25 A method of treatment of a subject comprising administering to the subject an effective amount of fine particles according to claim 21.

26 A method according to claim 25 in which insulin-dependent diabetes is treated by administration of insulin particles.

27 Fine particles, each having a substantially similar shape and size according to claim 21.

28 A method according to claim 1 wherein the fine particles flow with the dense gas from a first vessel in which the particles are formed to a second collection vessel, from which the particles are collected.

29 A method according to claim 28, the second collection vessel having an inlet and an outlet disposed above the inlet, in which the fine particles and dense fluid pass through the inlet and the flow of dense fluid through the outlet is adjusted to maximize the proportion of fine particles collectable from the second collection vessel.